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The Good, The True, The Beautiful: Are They Attributes of the Universe?

DEDICATED TO FRITZ KUNZ, WHOSE LIFE WAS THE EMBODIMENT OF GOODNESS, TRUTH, AND BEAUTY.

ANCIENT INDIAN AND PLATONIC METAPHYSICS CONVERGE WITH CONTEMPORARY FIELD PHYSICS

. . . then, if we are not able to hunt the Good with one idea only, with three we may catch our prey: Beauty, Symmetry, Truth are the three . . .
— *Plato,* Philebus

The Law is the Truth and the Truth is the Law. The Truth and the Law are one.
— Brihadaranyaka Upanishad

To know that what is impenetrable to us really exists, manifesting itself as the highest wisdom and the most radiant beauty . . .
— *Albert Einstein*

THE AFFIRMATION OF GOODNESS, truth, and beauty as fundamental attributes of the universe is a legacy left to us by the sages of Greece and the seers of India. In its most coherent form, the doctrine has been traditionally identified with Plato, whose idealistic cosmology, metaphysics, and ethics have carried it down to us from the 4th century B. C. Far from being obsolete, Plato's triadic characterization of the cosmos is arousing renewed interest because, unexpectedly, contemporary science has arrived at some parallel conclusions.

For example, Harvard theoretical physicist Steven Weinberg expounds an essentially Platonic view in rejecting on a priori grounds the possibility that particle physics may violate the law of symmetry, which is itself aesthetic and derives from the idea of the beautiful: "'The answer . . . is that superficially some of these symmetries are broken and that nature, as we observe it, is but an imperfect representation of its own underlying laws.' He likens the concept to Plato's images on the cave walls (*Republic* VII), which were imperfect imitations of reality."[1] Indeed, the aesthetic requirements of elegance and simplicity are ultimately demanded of a valid physical theory, as Margenau has reiterated.[2] Nobel Laureate Richard P. Feynman, addressing himself to the problem whether, amidst diverse possible scientific theories, we can chose the one theory that is "right," replies: "Yes, we can recognize truth by its simplicity and by its beauty."[3]

These developments raise three central questions with which this paper will deal: (1) Is it legitimate to ascribe properties like "truth," "beauty," and "goodness" to nature as a whole? (2) Is there some *additional* feature of truth (absent in the scientific vision but present in that of sage and seer) that would suggest why 20th century science has not succeeded in *replacing* these ancient

claims (rather than displacing them to the edge of modern culture)? (3) Since science accepts the concept of truth and also that of beauty, can we, extrapolating from philosophical visions, predict that it will ultimately confirm the good as well? To explore these questions, we shall turn first to Plato, then to some parallel Eastern claims, and shall lastly probe the connections of these idealisms with 20th Century physics.

Idealism in its metaphysical (as contrasted with its ethical) sense embodies a claim about the fundamental structure of reality. Plato, the most influential Western metaphysical idealist, maintains that reality is unbroken, abstract and ideal, one non-material *Eidos* or Form underlying all that is. By contrast with, for example, the subjective idealism of Berkeley, the ideas are to Plato not mind-dependent, that is, they do not arise in some human mind; rather, they are eternal and independent of life, which continually arises and perishes, whereas Ideas, being uncompounded, are immutable.

To sharpen our conception of metaphysical idealism, we must ask ourselves: idealism versus—what? The answer, of course, is versus materialism, represented in the West by such figures as Lucretius, Bacon, Hobbes, Descartes (insofar as he propounded *res extensa,* his theory of matter), and Marx, and in the East by the 7th century B. C. Lokayata or Carvaka school in India. Metaphysical materialism holds the ultimate ground of the universe to be matter: an inert, opaque, self-sufficient,[4] billiard-ball ultimate unit extended in space, to which all entities can be reduced and by whose laws they can be explained. This view lies at the opposite extreme of Platonism, Indian Idealism, or indeed, of contemporary physics. The question arises, therefore, whether the philosophical terms "idealism" and "materialism" can validly be applied to other cognitive contexts such as science which, like metaphysics, make claims about reality. We shall argue that physics is the predominant 20th century idealism, and that, consequently, empirical as well as so-called "pure" conceptual systems can be "idealistic."

Plato, surveying in the 4th century B. C. the efforts of two hundred years of Greek philosophy, synthesized these around the single most important problem with which his predecessors had struggled: the problem of the one and the many, which involves questions of permanence, change, and motion. The existence of truth is for Plato the indubitable fundament on which philosophy rests. If truth did not exist, philosophy could not exist, for philosophy is based on knowledge, and without truth knowledge would be impossible, leaving only opinion or belief relative to each observer, incapable of dispute or adjudication. Seeming would be equivalent to being, surface appearance to profundity; no claim could be proven false and consequently none true—a position Plato exhibits as untenable in the *Theaetetus,* where he refutes the Sophist view that knowledge is perception.

Against this realm of becoming, characterized by cognitive and ethical relativism, Plato upholds the realm of Being as alone fully real. His criteria of reality are that it must be eternal, immutable, ultimate, hence nonmaterial, simple and uncompounded (like a point without dimensions), incapable of being pulled apart by time or any other force. Since nothing in the sensible realm meets these criteria, nothing in the sensible realm is real. This is not to ascribe an hallucinatory status to the phenomenal world; its entities possess a qualified reality insofar as they "copy" and consequently are muted likenesses of their source, the Forms or Ideas. This relationship has been most clearly set forth in the *Republic* (VI, VII), where the derivative and temporary nature of sense-objects is likened to that of puppets, "imitating" the genuine entities to which they owe their existence. They are useful catalysts that stir the soul into remembrance of their source, the ultimates which it once glimpsed whole and which they have the power to evoke *(Phaedo, Phaedrus).* Pursued far enough (namely, to its very origins), any particular finite entity will lead us to its universal and infinite source *(Symposium).*

The truth about the sensible world thus lies in the intelligible world; mere percepts and facts cannot yield knowledge, since they lack the informing principle that alone can *explain* (not merely *describe*) them. To explain is to illuminate the seemingly isolated particular in the light of the universal. This process involves cosmic principles, for Plato's universe is organic and organismic, a living entity endowed with intelligence and a soul, as he says in the *Timaeus*. In consequence, nothing exists in isolation: the particular truth and being of everything is indissolubly wedded to the truth and being of the whole. Such an insight is wrung from experience only by arduous effort and philosophical training. It demands de-emphasizing the world of perception which, by virtue of its unrelated randomness, is inimical to the synoptic vision of the truth.

"Let us say that the stable and pure and true and unalloyed has to do with the things which are eternal and unchangeable and unmixed. . . ." Thus, in *Philebus* (59), one of his last works, Plato circumscribes his notion of truth. As in earlier dialogues, he withholds an outright definition, restricting himself to symbolic or metaphorical allusions such as "true Being," or description by negation: "There abides the very being with which true knowledge is concerned: the colorless, formless, intangible essence, visible only to mind. . . ." (*Phaedrus* 247).

The failure to pin truth down discursively is intentional, and an integral part of Platonic doctrine. This silence (contrasting with Plato's customary explicit analyses in, for example, the critical dialogues) is meant to teach us that there are things which cannot be taught. We find him repeatedly stressing the experiential reality of his ultimate concepts. These cannot be conveyed in words, whose sole function is to inspire us to search on our own (*Phaedrus* 276).

The ineffability of ultimates applies above all to the sacrosanct Platonic concept, the One, regarding which

Plato demonstrates that all predication leads to contradictions (*Parmenides*). He therefore ends the dialogue with an ontological generalization: "Then we may sum up the argument in a word and say truly: if One is not, then nothing is." (166) Thus, the limitless One can be neither defined nor described. For these reasons, Plato in the *Republic* rejects even the most exact and exalted of all languages, mathematics, as insufficient to the region of Being, to which *dialectic* alone can lead us.

The stricture upon mathematics is striking, since in such works as *Meno, Phaedo, Republic,* and *Timaeus* Plato elevates it to the privileged human language. Yet even mathematics can be faulted on two counts: First, it utilizes diagrams and equations, both of which are rooted in the sensible world (lines, chalk, dimensions, etc.) and hence subject to distortion. Second and more significant, even mathematics employs unexamined definitions, axioms and hypotheses, which are assumed, but not known, to be true. By contrast, dialectic, "that other sort of knowledge," yields unmediated intuitive insight.

> [Dialectic] treats its assumptions not as first principles but as *hypotheses* in the literal sense, things "laid down" like a flight of steps [cf. *Symposium*] up which it may mount all the way to something that is not hypothetical, the first principle of all; and having grasped this, may turn back and . . . descend at last to a conclusion, never making use of any sensible object, but only of Forms, . . . (*Republic* 511)

If mathematics fails to explicate true being, all language will fail. Nevertheless, if being *could* be designated, Plato would do so in terms of goodness, truth and beauty. Lest the familiar moral, intellectual, or aesthetic overtones of those terms mislead us into anthropomorphic attributions, Plato wrenches them from their ordinary contexts. Beauty *(Philebus 51)* is not sensuous but abstract. It requires no social consensus for it is a cosmic concept connected on the one hand to truth, on the other to goodness. Preserving the Pythagorean vision of a mathematical universe, Plato links truth to order. Ratio, harmony, pattern and proportion underlie the universe, from the grain of dust to the galaxies: ". . . and God fashioned [the elements] by form and number . . . and [the body of the universe] was harmonized by proportion." (*Timaeus* 51-90). Lest this profound principle be mistaken as pragmatic, Plato distinguishes it from the mere mechanical counting or sorting that enable us to "manage" the world. Through mathematics, ". . . the power of the good has retired into the region of the beautiful, for measure and symmetry are beauty and virtue all the world over." (*Philebus* 64). Foreshadowing 20th century mathematical physics, Plato proclaims that "truth is akin to proportion." (*Republic* 486).

Beyond this, he makes a more sweeping claim: "truth" by itself, apart from beauty and goodness, is not truth but meaningless technology. Pursued without philosophy (love of wisdom), truth leaves us empty-handed (*Republic* 532). To reflect, for example, on the nature of numbers *per se*, ". . . is a thing . . . which I would . . . call useful: that is, if sought after with a view to the beautiful and good; but if pursued in any other spirit, useless." (*Republic* 531). Evidently, then, Platonic metaphysics cannot be grasped without the idea of the good. Although he repeatedly affirms that goodness and beauty are inseparable from each other and from truth (*Symposium, Lysis*), and though he specifies the criteria for beauty and truth rehearsed earlier in this paper, he offers none for the good. His most important concept thus remains elusive.

At best, Plato tells us how the good functions and what its absence would portend. It is clearly no mere human sentiment or expression of approbation or taste, but rather a force of nature. In the *Republic* (508) Plato characterizes the good as "that which imparts truth to the known and the power of knowing to the knower." As to the objects of knowledge, "these derive from the good . . . their very being and reality." Nonetheless, the good cannot be equated with being, for it exceeds it in "power," namely, as "the author of science and truth, and yet surpasses them in beauty." (*Republic* VI). Far from being a neutral or value-free principle, the good is frankly teleological.

Discussing the nature of scientific explanation in the *Phaedo*, Plato attacks those who, like Anaxagoras, mistake description for explanation. What Anaxagoras (who used the concept of *nous*, mind, but assigned it a mechanistic function) forgot was "the binding power of the good," complains Plato. Without invoking this force of cosmic cohesion, we are left with pseudo-explanations instead of a genuine theory of nature. Plato's insistence on teleology remains alive even in one of his last works, the *Timaeus*.[5] Although the good is the author of being and thus set higher, the *Timaeus* in some sense equates the two, for the Demiurge "looked to what is best" in fashioning the universe. Value was therefore woven into the very fabric of creation, since the good furnished divine ideation with its model. The perfection of the good thus was translated into even so imperfect and refractory a medium as matter.

The account of the good leaves us with two dominant impressions: first, a sense of frustration that Plato's master-idea remains shrouded in mystery; second, a mounting certitude that the good is no mere metaphorical or mythical device, although Plato does at times so treat it. In numerous hints,[6] he holds out the possibility that we can experience the good directly, and the *Republic* may be construed as a methodological treatise towards that end.

> In the world of knowledge, the last thing to be seen and only with great difficulty, is the essential Form of the good. . . . Without having had a vision of this Form, no one can act with wisdom. . . . The soul . . . can learn by degrees to endure the sight of being, and of the brightest and best of being, or in other words, of the good. (*Republic* 517-518)

Such passages impart Plato's conviction that although being is saturated with good and the cosmos *perfect* in

Spinoza's sense, by its mere existence, we must guard against anthropomorphic connotations of these terms, for the path to the good is perilous for the unprepared. Hence he admonishes mankind to learn "to *endure*" the sight of being and "to *bear*" the vision of the good, "its reality and . . . supreme splendor." Such language rules out the possibility that the good refers to taste or pleasure, and urges the proposition that it is a cosmic force whose magnitude can overwhelm us, and which we must therefore approach "by degrees." Plato's position—cautioning aspirants against a too rapid approach to the good while simultaneously urging their ascent towards it—evokes other philosophies which share his attitude towards experiential union with the ultimate.

To students of Indian philosophy, the Platonic concepts of good, true, and beautiful find correlates in *sat* (being), *cit* (consciousness), and *ananda* (bliss). Let us note that like Plato, the Indian philosophers denied the possibility of predicating any properties whatever of the ultimate, exemplified in their phrase *neti, neti*: "not this, not that." Nevertheless, they provide some approximative attributes for Brahman, the immutable principle of reality: It is one rather than many, abstract and universal rather than concrete and particular; ideal and nonmaterial; eternal because uncompounded, i.e. "unborn"; infinite, not localized; hence field rather than finite thing; beyond words, thoughts, or concepts—"the one-without-a-second," as the Upanishads and later Shankara, propounding Advaita Vedanta, term it.

Brahman, not a god but a principle, corresponds to Plato's intelligible world, the source of being and the principle of life. As in Plato, knowledge thereof leads away from sense experience; after consciousness becomes commensurable with the object it seeks, it can know true being. "The subtle Self . . . is realized in that pure consciousness wherein is no duality [the meditative state]. . . ."[7]

Meditation,[8] we are told, transmutes the conditioned and partial into the unconditioned absolute. In Mahayana Buddhism, for example, the aim of meditation is to achieve the state of *sunyata*, emptiness, which is to say devoid of "self-nature" or delineable properties. It seems reasonable to conjecture that *meditation functions in Oriental philosophy as dialectic does in Plato*; both are direct, unmediated experiences of being that involve man's spiritual or higher consciousness. Just as dialectic is Plato's "coping stone of the sciences," surpassing even mathematics in its capacity to train us for "the contemplation of the highest of all realities" (*Republic* 533), so meditation is regarded as the unrivalled road to reality in Indian and Tibetan philosophy. Methodologically, these traditions view it as a form of empiricism, free from unexamined assumptions, and radical in the sense of reverting to the roots of experience. "Brahman can be apprehended only as knowledge that is one with reality, inseparable from it. For he is beyond all . . . instruments of thought . . . and arguments."[9] We shall examine this claim in greater detail, but first we must turn to a recurrent statement in the *Upanishads* that threatens the position we have been developing.

"In Brahman there is no diversity: he who sees diversity goes evermore from death to death."[10] This assertion rules out even predicates such as the good, the true, and the beautiful. So emphatically do the Vedantists and Madhyamika Buddhists stress the notion of the One, that an improper grasp of this truth entails man's imprisonment in the wheel of time. Epistemology is thus the gateway to salvation: freedom from enforced re-death.[11]

Despite this insistence on the One, however, Eastern thinkers (like their Greek counterparts Parmenides and Plato) were compelled to cope with the diversity and multiplicity of the perceived world. The problem of creation, the most stubborn in philosophy, is insoluble because it leads to the Antinomies of Reason, as Kant observed.[12] Yet it is an ever-present, nagging issue. "Why is there anything rather than nothing at all?": the question attributed to Anaximander of Miletus epitomizes the impotence of reason before the riddle of creation. Two qualified answers have been offered. Shankara, the most consistent of all non-dualists, expounds his "doctrine of superimposition," which argues that multiplicity is the illusory *figure* superimposed by the unenlightened consciousness upon the one veridical undifferentiated *ground*.[13] But Shankara's doctrine is so subtle as to baffle all but the few. Heinrich Zimmer offers a penetrating statement of the problem: the consciousness that asks for an answer to the question of creation exists within time, and therefore cannot understand the answer. For the enlightened consciousness, which alone could comprehend the answer, the question has disappeared.[14] To use Kantian terms, a phenomenal question in search of a noumenal answer is a self-evident paradox. Thus, despite some teleological allusions to the rationale of creation sketched in both Plato and Oriental philosophy,[15] the *why*, though asserted, remains unelaborated. We must content ourselves with the *how* of creation, with imaginative models such as the intuitive metaphor from the *Svetasvatara Upanishad:* "Like the butter hidden in cream is the Self which pervades all things."

The elegance and simplicity of this metaphor evoke the paradigms of the contemporary cosmologist, as do its monism and idealism. All diversity can be accounted for by means of one reality, transforming itself out of its own ground. The butter *is* the cream that has curdled itself into seemingly solid particles. Invoking Aristotle, the efficient cause (motion, or rather the geometry of space itself, as we shall shortly see) is a contracting or curving mechanism of the material cause, the cream, due to the formal cause, Brahman, the field, for the sake of a final cause that remains inscrutable to discursive thought. But if the final cause is obscure, the material and efficient causes of the cosmos are not.

Curiously, 20th century atomic physics is closer to the theories of Greek and Indian antiquity than it is to those of the intervening centuries. The physics of the 18th and 19th

centuries believed the universe to consist of tangible matter. But unlike the butter of our metaphor, the atomic material was seen as ultimate, causative, and extended "in" space—the ultimate impenetrable building blocks of all entities (Dalton), later conceived as a penetrable miniature solar system (Bohr-Rutherford) distinct from space, set into space, and different in kind from space itself.

Einstein's Theory of Relativity revolutionized that picture, moving us towards the monism and idealism of the Platonic-Vedantic traditions. It now appears possible that features of the cream-butter metaphor of matter can be mapped onto the current physical paradigm of creation.[16] Here we can offer only the barest outline, to furnish a framework for the questions sounded at the outset. The central of these is the status of truth, particularly that of physics, the frontier science that functions as our listening-post to the universe. The problem is two-fold: (1) What does 20th century physics hold truth to be? (2) How does this view relate to the theme we are pursuing?

The theories of contemporary physics cohere in many respects with the philosophical claims of Plato and the Vedantists. "Matter, in the old sense of something that occupies space, does not exist."[17] In its stead, we have a nonmaterial, vibrating continuum, a plenum of interpenetrating force fields, such as the gravitational, electromagnetic, strong and weak nuclear fields. Being nonmaterial, these force fields can be known only inferentially, by means of *test-objects* that reveal their presence, as a bar-magnet and iron filings, for instance, reveal the presence of the magnetic field. The conception of atoms as entities vibrating *in* space has been discredited, for there are no "atoms" *to* vibrate. Rather, space itself, which is universal, infinite, internally consistent and ultimately intelligible, is a supersensible field that is the source of everything in the universe, as F. L. Kunz points out.[18] When it thickens itself regionally, that is, when it localizes itself via its own geometries (resulting in this particular example in a curve or "deformation," as physicists term it), we have what we term "atoms," which are in fact "standing wave-systems in localized active fields."[19] As Pythagoras correctly foresaw, atoms are fundamentally harmonic: self-ordered waves that have slowed down. "What Planck determined was not a thing but an event: a little energy for a little while."[20]

This scientific cosmology, though known for over half a century, still startles us by its strangeness. Commenting on its unfamiliarity, Kunz predicted that "present data will look very different after we have habituated our minds to the fact that the force field potentials (noumena) are the reality"[21] rather than their transient and more obvious derivations known as matter, i.e., once we grasp the meaning of the Einstein universe:

> What impresses our senses as matter is really a great concentration of energy compressed into a comparatively small space. We could regard matter as the regions of space where the field is extremely strong.[22]
>
> If matter approaches the speed of light, it is termed "energy," and conversely, if energy "congeals" it is seen as matter.[23]

And further emphasizing the priority of the field, Einstein asserts that "there would be no place, in our new physics, for both field and matter, field being the only reality."[24] The nature of the field is not yet entirely specified, and descriptions may vary. Henry Margenau, for example, argues that "[fields] all represent a continuous distribution of some quantity which needs to be further specified in each particular case."[25] Yet despite differences, physicists seem to agree that fields are primary, causal with respect to things, and enduring rather than ephemeral. Matter is the partial and temporary expression of the field, and this invisible and intelligible reality is somehow linked with space.

With respect to the latter, Princeton astrophysicist John Wheeler believes space to be the basic ingredient of atoms, and speaks of the "incredibly energetic world of 'things,' each smaller than an electron by 20 powers of ten, each 'thing' composed of nothing but space itself, *pure fluctuating space* . . ., space that is changing, dynamic, altering from moment to moment."[26]

> There was a time when one looked for a building material to make molecules out of, and we discovered atoms. Then we looked for what atoms were built of and we discovered protons, neutrons, electrons. Today, if we look for the building material of electrons, we may be making an unnecessary search. We already have a building material: space itself. Of course, what space itself is built out of is the next question—a question we don't know how to answer.[27]

One possible answer is furnished by F. L. Kunz, namely that space itself is governed by the metric field, pure ideality devoid of energy or force.

> Thus a field is really a compound of its energy-potential characteristics, *and of the metric*. . . . By their mere passive being the ideations (or geometries) of nature may have a sovereignty superior to the most powerful of the energy-matter systems.[28]

Wheeler's theory of *superspace* reaches even beyond Einstein:

> The stage on which the space of the universe moves is certainly not space itself. . . . The arena must be a larger object: *superspace* . . . [which] is not endowed with three or four dimensions [but] with an infinite number of dimensions. Any single point in superspace represents an entire, three-dimensional world.[29]

Earlier we asked how contemporary physics relates to the theme we have been pursuing. Wheeler makes the relationship explicit, for the infinity of space is the fundamental category in Hindu and Buddhist cosmology. Kunz notes that "*Parabrahman* is the Indian word for the reality in which Atman occurs, in which it is lodged. *Parabrahman*

is equivalent to space."[30] If Atman pervades space, it follows that space is neither empty nor inert.

However fantastic may seem the phenomenon of the pure "nothingness" of space seething with activity and creating "something" out of itself alone, Wheeler states that "anyone who accepts the quantum principle is *forced* to believe it."[31] Space in this sense is very like divine ideation in the *Timaeus*, even though Plato distributes the world's work among the receptacle (space), Demiurge (energy principle), and pattern (telos, the good). Similarly, space is the ontological key to Indian and Buddhist metaphysics, where it is termed *akasha* (from *kas*, to radiate or shine), and applies to both matter and consciousness, as Lama Govinda explains:

> In its grossest form *akasha* presents itself as matter; in its subtlest forms it merges imperceptibly into the realm of dynamic forces. . . . It comprises infinite dimensions. . . . Our consciousness determines the kind of space in which we live. . . . The way in which we experience space . . . is characteristic of the dimension of our consciousness.[32]

Thus, the scientific doctrines sketched above bear a threefold connection to the metaphysical idealism we have been discussing. The mathematical theory of the universe, the ideal abstract metric field, and the primacy of space in field physics or geometrodynamics, link science with both Plato and Indian cosmology, where Brahman, the field, is conceived as the primal energy from which "all beings are born." (*Taittriya Upanishad*)

These systems stress the *ground*, namely the stability and continuity of the cosmic canvas. When we shift our perspective to the *figure* that stands projected against the *ground*, we note a resemblance between quantum mechanics and Madhyamika and Tibetan Buddhism. Both dwell on the dynamism of the universe: its relentless self-renewal, a moment by moment creation and dissolution of even the most infinitesmal unit of being.

The foregoing urges the conclusion that scientific truth does not conflict but converges with the truth of metaphysical idealism; truth for both is not a mental construct but a property of the universe. Thus, when Weinberg was recently asked whether or not there is really something "out there" corresponding to the physicist's pointers and dials, he answered: "We make a compact with ourselves to *act* at least as if we believe that there's something out there, as if the things we're talking about have an objective reality."[33] This, however, might be construed as a merely updated version of William James' "will to believe," too fragile a construct to carry the Promethean weight assigned to it. To counter this fragility, we must look to a more radical empiricism, complementing that of science, that could furnish us with verification for these theories. The Indian concepts of *sat, cit,* and *ananda* may provide such a tradition.

Cit literally means awareness or consciousness, but we shall see that it connotes far more than this, for it functions both epistemologically and ontologically. Genuine knowledge in both Platonic and Indian philosophy is wisdom, i.e., a non-dualistic *state of being* in which the knower, the known, and the process of knowing become one. *Cit*, while analagous to Plato's "truth," is more consistent about its thesis, a self-conscious cosmos—a notion that Plato makes explicit only in the *Timaeus*. The postulate that allows for this identity of knower and known rests on the equation of Brahman with Atman. Since matter is materialized energy (*prana*), it is a manifestation of the spiritual and eternal essence of "the real." Throughout our discussion, we have been emphasizing ontology: that the world is materialized Brahman. We must now turn to man's awareness of this truth, i.e., to the epistemological aspect of our Upanishadic metaphor.

> Like the butter hidden in cream, pure consciousness resides in every being. It is to be constantly churned, with the mind serving as the churning rod. . . . Knowledge of the Self is gained through meditation.[34]

This theory of consciousness encompasses cosmic creativity on the one hand (for Brahman precipitates itself as matter), human creativity on the other, when through the churning rod or tool known as "meditation" the illusory ego goes back into solution, reunited with the creative consciousness that is its source. Such a reversible equation recalls the Einsteinian equivalence of matter and energy, the particle and wave identity of quantum physics, and finally, Plato's dialectic. In the latter case, the ascent from the cave resolves multiplicity into ultimate unity; the descent reacknowledges the relative reality of the sensible world.

The idea of an alive, self-conscious universe is not altogether foreign to scientists such as Schrödinger, Wigner, and Margenau. Margenau, for example, refers to the "four-dimensional world-lines of physics, the representations of all events, in which neither past nor present nor future can be differentiated," as "well-infused with self-consciousness," and notes their affinity to the equivalence of Brahman and Atman.[35] Wigner and Schrödinger both grant that consciousness influences matter.[36] Moreover, Schrödinger, like Margenau, was struck by the Upanishadic equation of Brahman and Atman, a concept he considered "the quintessence of deepest insight into the happenings of the world."[37]

That having been said, the question remains whether the reality of sage and scientist can really be considered identical. The intentional object of both seems the same: discovery of what is ultimate, enunciated in the simplest terms. This entails a language that in each case is (1) highly technical (2) counter to common sense realism (3) abstract and admittedly approximative (4) supported by an elaborate infrastructure.

Atman, the eternal Self, is said to be "nearer than the nearest," yet at the same time "farther than the farthest"

and "subtler than the subtlest." In physics, to penetrate the postulated ultimate particle, the quark, of even a millimeter of matter, demands accelerators ranging from two to five miles. Only then can the particle acquire the requisite high energy that would manifest it to an observer. Analogously, the *experiential conviction* that Atman (oneself) and Brahman (the world) are *already* one is impossible without traversing meditational metaspaces vaster than the spaces traversed by high energy particles about their magnetic rings. An identical law seems to govern both phenomena: only at infinitely higher energy levels than those at which matter and consciousness customarily vibrate is their true nature revealed. This seems a strange state of affairs, challenging our differentiation of subjective and objective knowledge. Yet Wheeler, confronting equally alien frameworks in his work on black holes, finds "strangeness" no contraindication of truth. "We will first understand how simple the universe is when we recognize how strange it is."[38]

An inference can be drawn that truth, properly grasped, appears to human consciousness as beauty, so that it suffuses us with joy. Plato's equation of truth and beauty is echoed in *ananda*, i.e., bliss, joy, beatitude, which is associated with the liberated consciousness that knows itself to be divine (*moksha*). *Sat*, the Sanskrit term for being or "the actual," functions like Plato's good. (To denote their inseparability, *satcitananda* often occurs as one word in the literature.)

The second question we originally posed was: "What does science lack that has deprived it of its full pre-eminence in our culture as bearer of truth?" We suggest that the answer lies in the too rigid restriction of the boundaries of science—its unexamined assumption, for example, that "the good" lies beyond its domain of inquiry in a separate "subjective" realm called "value." This apparent rejection denies the intrinsic ontological reality of the good, and thus renders science cold, neutral, and dehumanized. Severed from goodness and beauty—its supreme principles and *meaning*—truth becomes weightless, incapable of claiming man's inspiration, allegiance, or even his interest. The result is a sense of unconnectedness to the truths science exhibits. It could, of course, be argued that Plato's concept of truth and the Indian *cit* can equally be faulted as purely impersonal universal principles. But they are firmly united with beauty and goodness, on the one hand, and with *ananda* and *sat* on the other.

The concept of a universal "all" transcends its status as classificatory truth through the experience of beauty and bliss, becoming thereby a living force that pulls man "in" through *integration, not reduction.* The indifference and unresponsiveness to truth unadorned—which are so apparent in our society—become irrelevant before beauty, and inconceivable when the good or *sat* is experienced as a living reality, for to experience the good is to undergo a change in consciousness.

Goodness, truth, and beauty, consequently, are not properties of the universe in the Cartesian or Lockean sense. They are modalities in which the universe is experienced when apprehended *in depth* by an awakened consciousness. This depth-consciousness is functionally stratified according to a septenary system detailed in classical Indian philosophy. As we proceed from the level of immediate sense perception to mental constructs and generalizations, and thence to an intuitive apprehension of wholeness, the quantified world of discrete entities begins to take on aesthetic form. In Sanskrit terminology, what *manas* (the mind) comprehends as truth, *buddhi* (the intuition) recognizes as beauty, and *atman* (the highest spiritual consciousness) apprehends in a unitive vision as the good.[39]

Science is beginning to acknowledge that truth and beauty have an intrinsic relationship. Einstein's sense of awe before the simplicity of the mathematical laws that govern the universe is legendary:

> Can we ever hope to find the right way [to truth]? Nay, more, has this right way any existence outside our illusions? . . . I answer without hesitation that . . . our experience hitherto justifies us in believing that nature is the realisation of the simplest conceivable mathematical ideas.[40]

Feynman affirms and, if anything, strengthens this view: "To those who do not know mathematics, it is difficult to get across a real feeling as to the beauty, the deepest beauty, of nature."[41] Pondering the problem of prediction and extrapolation, one of the distinctive features of science, he writes: "What is it about nature that lets this happen, that it is possible to guess from one part what the rest is going to do? . . . I think it is because nature has a simplicity and therefore a great beauty."[42] Such statements underline the fact that beauty is not extraneous to the scientific method, but an indispensable element in evaluating competing theories. Beauty has thus *acquired predictive power,* and become an intrinsic part of science, guiding it towards truth.

That brings us to our last question. Given that science accepts beauty and truth as criteria of reality, what does it say about the good? As yet, very little. Feynman does hazard a cryptic speculation that "the next great era of awakening of human intellect may well produce a method of understanding the *qualitative* content of equations . . .,"[43] but it is difficult to envision the form that scientific verifications of the value dimension might take. Still, such speculation points the way which an open-minded curiosity may initiate.

Science, after all, is not a "thing." To reify it rigidly is Whitehead's "fallacy of misplaced concreteness." In this century, particularly, scientists seem aware of the tentative and symbolic fabric of their formulations. Intrinsically, reality is neither the formulae of science nor the metaphors of metaphysics. Reality *is.*

"To find nature herself, all her forms must be shattered." Meister Eckhart's dictum captures the direction both of

20th century physics and of the ancient metaphysics which we have been exploring. These latter appear to have moved with ease for some thousands of years through a terrain that is novel to science, and hence they are at home with ideas like "creative emptiness," (*sunyata*) or the "radiance" of the unformed. The quantitative splendor becomes qualitative, we have suggested, when apprehended through dialectic or meditation, which are means towards "shattering" nature's forms.

Hence our final question: since science has granted two out of the three attributes we have been probing as fundamental to the universe, can we expect it some day to come up with the third of these, the good?

Our answer, at best conjectural, is that a supplementary methodology to the current scientific one, namely the radical empiricism adverted to earlier, can lead the scientist qua human being to determine—using himself as the test-object—whether or not this third attribute exists. Such experimentation would be of great scientific interest. If this experienceable "radiance," the good, which according to Plato is so powerful that it "makes truth possible," ever becomes part of the domain of scientific discourse (as beauty and elegance already have), we may anticipate a revolution in thought, a new paradigm in Kuhn's sense.

That paradigm would re-draw the map of being. If truth, goodness, and beauty are one, fact and value become one. The schism between the inner and the outer, which since Hume and Kant has bequeathed us a schizoid and fragmented world, could then be healed.

Notes and References

[1] Address to the Optical Society of America, *N.Y. Times,* April 29, 1974, p. 21.

[2] Henry Margenau, *Open Vistas* (New Haven: Yale Univ. Press), 1961.

[3] Richard P. Feynman, *The Character of Physical Law* (Cambridge: M.I.T. Press), 1967, p. 171.

[4] Since Cartesian matter requires God's creation and sustenance, its self-sufficiency is qualified.

[5] Whether or not Plato "changed" his Theory of Forms depends on the dating of the *Timaeus;* see R. E. Allen, ed., *Studies in Plato's Metaphysics* (London: Routledge & Kegan Paul), 1965, pp. 317-369.

[6] *Symposium, Phaedo, Republic, Phaedrus, Philebus.*

[7] *The Upanishads,* tr. Prabhavananda and Manchester (N. Y.: New American Lib.), 1957, p. 47.

[8] "Meditation," a rigorous discipline aiming for spiritual self-transformation, must be distinguished from current fads which have more limited and superficial goals.

[9] *Brihadaranyaka,* in *The Upanishads,* p. 110.

[10] *Ibid.*

[11] "Enforced" because the enlightened Buddhist Bodhisattva *choses* whether or not to incarnate.

[12] Kant demonstrates that pure Reason, disconnected from experience, cannot adjudicate the contradictory metaphysical inferences it can draw with equal validity.

[13] Shankara, *Crest Jewel of Discrimination,* tr. Prabhavananda and Isherwood (New York: New Am. Lib.), 1970.

[14] Heinrich Zimmer, *Philosophies of India,* Bollingen Series XVI (Princeton Univ. Press), 1969.

[15] Plato says the divine mind desired "that all things should come as near as possible to himself." *(Timaeus);* Hinduism's *lila* is cosmic, creative playfulness.

[16] The works of Margenau, Heisenberg, von Weizsäcker, Capek, Bohm, Wheeler, Kunz, Tiller, for example. Also Henry Margenau ed., *Integrative Principles of Modern Thought* (N. Y.: Gordon & Breach), 1972; *Main Currents,* 1-32.

[17] F. L. Kunz, "The Reality of the Non-Material," *Main Currents in Modern Thought,* 20, 2, 33-40.

[18] *Ibid.*

[19] *Ibid.*

[20] *Ibid.*

[21] *Ibid.*

[22] Einstein and Infeld, *The Evolution of Physics* (New York: Simon and Schuster), 1938, pp. 256-258.

[23] Einstein quoted in Ruth Renya, *The Philosophy of Matter in the Atomic Era* (New York: Asia Publ. House), 1962, p. 50.

[24] Einstein and Infeld, *op. cit.,* pp. 256-258.

[25] Henry Margenau, "Fields in Physics and Biology," *Main Currents in Modern Thought,* 15, 3, p. 61.

[26] John Archibald Wheeler, in *University: A Princeton Quarterly,* 53, Summer 1973, p. 29.

[27] *Ibid.,* p. 30.

[28] F. L. Kunz, *op. cit.,* p. 37.

[29] Wheeler, *op. cit.,* p. 29.

[30] F. L. Kunz, Mimeographed lecture notes.

[31] Wheeler, *op. cit.,* pp. 30-31.

[32] Lama Anagarika Govinda, *Foundations of Tibetan Mysticism* (New York: Samuel Weiser), 1972, pp. 116-130.

[33] Steven Weinberg, "Quarks," *Nova Series:* "Elementary Particle Physics," Educational Television Network, November 23, 1974.

[34] *Amritabindu* and *Svetasvatara Upanishads.*

[35] Margenau, personal communication to the author.

[36] Eugene Wigner, quoted in Arthur Koestler, *The Challenge of Chance* (New York: Random House), 1974.

[37] Erwin Schrödinger, *What is Life* (Cambridge Univ. Press), 1969, p. 93.

[38] Wheeler, "The Black Hole and Beyond," Lecture delivered at Princeton University, November 7, 1974.

[39] The septenary system widens Cartesian dualism into seven irreducible domains, ranging from the physical through the atmic, differentiated by their vibratory states. Even Buddhism, whose doctrine of anatta (non-existence of a permanent soul) might be expected to rule out such states or "vehicles," nevertheless presents their counterparts in the *Dharmakaya* or body of truth, the *Samboghakaya,* the body of bliss radiance, and the *Nirmanakaya,* the body "of the 4th dimension . . . integrating the dimension of individual corporeal experience with . . . [that] of the infinity of the *Dharmakaya* and the spiritual creativeness and rapture of the *Samboghakaya.*" Govinda, *op. cit.,* p. 22.

[40] Einstein, quoted in Yang, *Elementary Particle Physics* (Princeton Univ. Press), 1962, p. 65.

[41] Feynman, *The Character of Physical Law,* p. 58.

[42] *Ibid.,* p. 173.

[43] Feynman, *The Feynman Lectures on Physics,* Vol. II (Palo Alto: Addison Wesley), 1964.

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Reprinted from Main Currents Retrospective Issue Vol. 32, Nos. 2-5